

Applic. No.: 09/645,807

Amdt. Dated October 31, 2005

Reply to Office action of August 22, 2005

REMARKS/ARGUMENTS

Reconsideration of the application is requested.

Claims 1-14 and 23-24 are in the application. Claim 1 has been amended. Claims 15-20 have been previously cancelled. Claims 21-22 have now been cancelled. Claims 23-24 have been added.

In item 5 on pages 3-6 of the above-mentioned Office action, claims 1-5, 7-9, 12-14, and 21-22 have been rejected as being unpatentable over Schuele et al. (US Pat. No. 5,930,639) in view of Watabe (JP 5-315457) and Hwang (US Pat. No. 5,621,606) under 35 U.S.C. § 103(a).

In item 6 on pages 6-7 of the above-mentioned Office action, claim 6 has been rejected as being unpatentable over Schuele et al. in view of Watabe and Hwang and further in view of Chung (US Pat. No. 5,976,394) under 35 U.S.C. § 103(a).

In item 7 on page 7 of the above-mentioned Office action, claims 10-11 have been rejected as being unpatentable over Schuele et al. in view of Watabe and Hwang and further in view of Yang et al. (US Pat. No. 5,436,190) under 35 U.S.C. § 103(a).

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The rejections have been noted and claim 1 has been amended in an effort to even more clearly define the invention of the instant application. Support for the changes is found on page 9, lines 9-13 and 20-24 of the specification and original claim 21

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful.

Claim 1 calls for, inter alia:

forming a first conductive layer of the electrode configuration of a material substantially unetchable by chemical dry-etching, the first conductive layer containing a material selected from the group consisting of a 4d transition metal, a 5d transition metal, a conductive nitride thereof, and a conductive oxide thereof;

forming a second conductive layer of the electrode configuration on the first conductive layer from a material etchable by chemical dry-etching, the second conductive layer containing a material selected from the group consisting of aluminum, titanium, tungsten, a conductive silicide thereof, a conductive nitride thereof, and a conductive oxide thereof;

...

preventing, by the second conductive layer, breaking through of the electrode configuration and formation of redeposition of the material of the first conductive layer during the overetching.

Claim 1 of the instant application has been amended to specify that the first conductive layer contains a material selected

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from the group consisting of a 4d transition metal, a 5d transition metal, a conductive nitride thereof, and a conductive oxide thereof, and the second conductive layer contains a material selected from the group consisting of aluminum, titanium, tungsten, a conductive silicide thereof, a conductive nitride thereof, and a conductive oxide thereof.

In Watabe the electrode 10 at the bottom of the contact hole 22 is prevented from being broken through by controlling the etching rate by changing the size (diameter) of the contact holes 20, 22. Nowhere does Watabe disclose or suggest preventing the breaking through of the electrode by applying a second conductive layer containing a material selected from the group consisting of aluminum, titanium, tungsten, a conductive silicide thereof, a conductive nitride thereof, on a first conductive layer containing a material selected from the group consisting of a 4d transition metal, a 5d transition metal, a conductive nitride thereof, during overetching of the electrode configuration due to the different depths of the contact holes.

In contrast, in the invention of the instant application, the breaking through of the electrode configuration is prevented by the second conductive layer, not by adjusting the size of the contact holes.

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Although Schuele et al. disclose a titanium nitride layer, it is not disclosed or suggested anywhere in Schuele et al. that the titanium nitride layer can prevent breaking through of the electrode during overetching of the electrode configuration due to the different depths of the contact holes because Schuele et al. do not disclose forming contact holes of different depths.

According to column 4, lines 1-16 of Hwang, a conductive layer 17 is etched through by overetching to form trenches t.

Therefore, the teaching of Hwang contradicts the teaching of the invention of the instant application, which demands preventing breaking through of the electrode configuration.

Therefore, Hwang actually teaches away from the invention of the instant application.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claim 1. Claim 1 is, therefore, believed to be patentable over the art and since all of the dependent claims are ultimately dependent on claim 1, they are believed to be patentable as well.

Claims 23 and 24 have been added. Claim 23 differs from claim 1 in that the first conductive layer contains a material

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selected from the group consisting of ruthenium, rhodium, palladium, osmium, iridium, platinum, gold, silver and rhenium. The support for the feature can be found on page 9, lines 15-18 of the specification. Claim 24 differs from claim 1 in that the material for forming the first conductive layer is selected from the group of platinum metals and the material for forming the second conductive layer is titanium nitride. Claims 23-24 are believed to be patentable for similar reasons as discussed above in connection with claim 1.

It is also noted that claim 24 specifies that the first conductive layer is made of platinum and the second conductive layer is made of titanium nitride, as suggested by the Examiner during a telephone conversation with undersigned counsel on August 15, 2005.

In view of the foregoing, reconsideration and allowance of claims 1-14 and 23-24 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, counsel would appreciate a telephone call so that, if possible, patentable language can be worked out.

If an extension of time for this paper is required, petition for extension is herewith made. Please charge any fees which

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might be due with respect to 37 CFR Sections 1.16 and 1.17 to
the Deposit Account of Lerner and Greenberg, P.A., No. 12-
1099.

Respectfully submitted,


For Applicants

Yonghong Chen
Reg. No. 56,150

YC

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Lerner and Greenberg, P.A.
Post Office Box 2480
Hollywood, FL 33022-2480
Tel: (954) 925-1100
Fax: (954) 925-1101